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Specialty Pharmacy & Infusion Solutions

TITLE: ASSESSMENT AND MANAGEMENT OF INFILTRATION AND PHLEBITIS, AND EXTRAVASATION	POLICY NUMBER: NUR121
URAC STANDARDS: N/A	ACHC STANDARDS: N/A
TJC STANDARDS: N/A	
EFFECTIVE DATE: 1/1/2021	REVISION DATE: 4/1/25
REVIEWED DATE: 5/1/21, 5/1/22, 4/1/25	APPROVAL AUTHORITY: KATHLEEN PATRICK, PRESIDENT

I. POLICY

To ensure safe management of the IV catheter in the home, the nurse must have a thorough knowledge of signs and symptoms of phlebitis and infiltration. Prompt interventions by the clinician when phlebitis or infiltration is detected will minimize adverse effects. Drugs or agents with a significant potential to cause an extravasation injury, will be reviewed by the pharmacist on a case-by-case basis to determine whether the drug can be safely administered in the home setting. The pharmacist may consult with the physician prior to dispensing a vesicant agent. In the event of an extravasation, the nurse will follow emergency procedures and call 911 for emergency assistance, as applicable.

II. DEFINITIONS

A. Infiltration

1. The peripheral IV cannula is to be removed for any signs of infiltration, phlebitis, infection or drainage from the insertion site.

2. **Infiltration** is defined as inadvertent administration of non-vesicant solution/medication into surrounding tissue

Infiltration Scale	
Grade	**Criteria**
0	No Symptoms
1	Skin blanched, edema < 1 inch, cool to touch, with or without pain
2	Skin blanched, edema 1 to 6 inches, cool to touch, with or without pain
3	Skin blanched, translucent, gross edema > 6 inches, cool to touch, mild-moderate pain, possible numbness
4	Skin blanched, translucent; skin tights, leaking, skin discolored, bruised, swollen; gross edema > 6 inches, deep pitting tissue edema, circulatory impairment; moderate-severe pain, infiltration of any amount of blood product, irritant or vesicant.

B. Phlebitis

1. Phlebitis is defined as the inflammation of a vein used for IV infusion. There are four types of phlebitis:

a. Chemical - involving drugs or solutions.
b. Mechanical - involving the catheter body, i.e., insertion.
c. Infectious - involving bacteria.
d. Post-infusion phlebitis. Phlebitis is noted 48-96 hours after the catheter is removed.

2. Signs and symptoms associated with phlebitis are:

a. Redness, streak formation.
b. Site warm to touch.
c. Local swelling.
d. Palpable cord along vein.
e. Sluggish infusion rate.
f. Increase in basal temperature.
g. Pain

Classification of Phlebitis	
GRADE	**CLINICAL CRITERIA**
0	0 (zero) - no clinical symptoms
1	Erythema with or without pain.
2	Pain at access site with erythema and/or edema
3	Pain at access site with erythema, streak formation, Palpable venous cord
4	Pain at access site with erythema, streak formation, palpable venous cord> 1 inch in length, purulent drainage.

C. Extravasation

1. Extravasation is defined as inadvertent infiltration of vesicant solution or medication into surrounding tissue.

2. Prior to initiating care/services to a patient, all drugs or other agents will be assessed by the pharmacist, to determine whether it may create the potential for injury due to extravasation, such as a known vesicant.

3. Vesicants should be given by central vein. A vesicant is any agent that has the potential to cause blistering, severe tissue damage or necrosis when extravasated. The Pharmacist will evaluate patients on a case-by-case basis when orders are received for a vesicant drug.

4. Irritants may be given by peripheral vein but are **BEST** administered by central vein. Irritants are agents that cause aching, tightness, and phlebitis along the vein or at injection site, with or without a local inflammatory reaction. It does not cause tissue necrosis. The Pharmacist will evaluate patients on a case-by-case basis when orders are received for a vesicant.

5. Drugs exhibiting the potential for producing extravasation injuries share one or more of the following properties:

a. Hypertonicity
b. Non-physiologic PH
c. Intrinsic or direct cytotoxic effects

6. Drugs producing vasoconstriction and tissue ischemia may also cause extravasation injuries.

7. Agents which possess the potential for causing injury due to extravasation include, but are not limited to:

    a. Antineoplastic:

        1) Anthracycline antibiotics: Doxorubicin, Dactinomycin, Daunomycin
        2) Vinca alkaloids: Vinblastine, Vincristine
        3) Alkylating agents: Cisplatin, Mechlorethamine hydrochloride
        4) Taxane: Paclitaxel

    b. Sympathomimetic Amines: Dopamine

    c. Intravenous Fluids and Electrolytes.

        1) Calcium salts
        2) Dextrose solutions >10%
        3) Mannitol
        4) Parenteral nutrition solutions
        5) Potassium salts

    d. Miscellaneous:

        1) Diazepam
        2) Nafcillin
        3) Phenytoin
        4) Ganciclovir
        5) Amphotericin B
        6) Vancomycin
        7) Promethazine

    NOTE: Vancomycin concentrations of up to 5mg/mL may be infused at a rate not exceeding 200mL/hr~~.~~ ~~-~~via peripheral line or midline catheter but must be limited to no longer than 72 hours for a peripheral line and recommended not to exceed 7 days via midline catheter.

8. Signs of extravasation include:

    a. Pain or burning while drug is being given
    b. Blotchy redness around the needle site (may occur later)
    c. Severe swelling at site
    d. Inability to obtain blood return (usually)
    e. Fluid leakage from puncture site, subcutaneous tunnel, or port pocket
    f. Blister formation- may appear within hours or may be delayed for days

III. MANAGEMENT AND PREVENTION OF INFILTRATION, PHLEBITIS AND EXTRAVASATION

A. Preventative Measures

1. Use the following precautions with IV insertion:

    a. Refrain from using veins in the lower extremities. Consult the physician if this is the only avenue available.
    b. Select veins with ample blood volume when infusing irritating substances.

c. Avoid veins in areas over joint flexion.
d. Anchor cannulas securely to prevent motion.

2. To prevent injury to the wall of the vein, the cannula should be removed at an angle nearly flush with the skin.

3. When dealing with a vesicant medication, orders for specific treatment if an extravasation should occur should be obtained at the time of referral before initiation of therapy.

B. The following procedural steps are designated according to the size of an infiltrated area or the stage of phlebitis involved.

1. For an IV infiltration that measures **less than 5cm or stage 1+ or 2+** phlebitis:

a. Stop the infusion.
b. Remove the IV cannula.
c. Apply warm, moist compresses to site.
d. Elevate the extremity.
e. Restart IV in opposite extremity, if possible, and resume therapy.

2. For an IV infiltration that measures **greater than 5cm or phlebitis that is stage 3+ or 4+**:

a. Stop the infusion
b. Remove the IV cannula
c. Apply warm, moist compresses to site
d. Elevate the extremity
e. Notify physician of complication and obtain treatment orders
f. Restart IV in opposite extremity, if possible, and resume therapy

3. For signs of phlebitis, infiltration or drainage from the insertion site or exit site of a central venous catheter:

a. Stop the infusion
b. Apply warm or cold
c. Notify the physician immediately for further treatment and therapy orders
d. Discard soiled supplies in appropriate containers

C. Management of Extravasation:

1. Peripheral lines are not recommended when infusing chemotherapeutic and vesicant agents. Orders for peripheral route will be evaluated on a case-by-case basis, under special circumstances. (i.e. Dopamine for hospice patient).

2. Central Line:

a. Determine the cause of extravasation. Some causes include:
- Accidental dislodgment of needle from port septum
- Thrombus formation
- Catheter damage, displacement

b. Stop infusion

c. Disconnect the administration set from the VAD and aspirate any fluid. DO NOT FLUSH THE LINE.
d. Estimate amount of drug extravasated
e. Assess the surrounding area and mark the area of extravasation
f. Notify the physician immediately for further instructions
g. Call 911 for emergency assistance and transport patient to the nearest emergency room
h. Apply cold or warm compresses
i. Photograph suspected extravasation site whenever possible. Take photographs at follow-up visits

D. Follow up Measures and Patient Instruction for **infiltration/phlebitis:**

1. Instruct patient/caregiver to continue intermittent warm, moist compresses to site and keep extremity elevated for 24 hours.

E. Follow Up Measures and Patient Instruction for **extravasation**:

1. Observe site regularly for pain, erythema, swelling, induration and/or necrosis
2. Administer pain medications as ordered
3. Discuss need for plastic surgeon with the physician
4. Instruct patient to report sensation changes such as pain, burning or stinging at site

F. Document in the patient's record:

1. Date and time of the event
2. Type of venous access (needle size and type)
3. Insertion site
4. Medication administered
5. Sequence of medications
6. Approximate amount of drug extravasated or suspected to have extravasated
7. Nursing interventions (if any) used
8. Subjective symptoms reported by the patient
9. Nursing assessment of the site
10. Physician notification
11. Follow-up measures taken, and patient instructions given

G. Complete appropriate form to report incidents to agency personnel, if indicated.

IV. TRAINING

This policy will be posted on the Company shared drive.

V. APPROVAL HISTORY

Approved By:	**Title:**	**Date:**
Kathleen Patrick	President	01/01/2021
Kathleen Patrick	President	05/01/2021
Kathleen Patrick	President	05/01/2022
Kathleen Patrick	President	04/01/2025

VI. REFERENCES

Nickel, B., Gorski, L., Kleidon, T., Kyes, A., DeVries, M., Keogh, S., Meyer, B., Sarver, M. J., Crickman, R., Ong, J., Clare, S., & Hagle, M. E. (2024). Infusion Therapy Standards of Practice, 9th Edition. Journal of Infusion Nursing, 47(1S), S1–S285. https://doi.org/10.1097/nan.0000000000000532

Appendix A
Common Irritants and Vesicants

Vesicants

Alkylating agents
- Cisplatin (in concentrations more than 20 ml of 0.5 mg/ml)
- Mechlorethamine hydrochloride (Nitrogen mustard)
- Streptozocin (Zanosar)

Antitumor antibiotics
- Doxorubicin (Adriamycin)
- Daunorubicin (Cerubidine)
- Mitomycin (Mutamycin)
- Dactinomycin (Actinomycin-D)
- Mitoxantrone (Novantrone)
- Epirubicin (Ellence)
- Idarubicin (Idamycin)

Vinca Alkaloids
- Vincristine (Oncovin)
- Vinblastine (Velban)
- Vindesine (Eldisine)
- Vinorelbine (Navelbine)

Taxane
- Paclitaxel (Taxol)

Dopamine
- Norepinephrine (Levophed) [>24 hrs, central line recommended]

Antibiotics
- Nafcillin (Nafcil)

Antivirals
- Acyclovir (Zovirax) [conc </= 7 mg/mL for non-central line. > 10 days central line preferred]
- Ganciclovir (Cytovene)

Irritants

Alkylating Agents
- Carboplatin (Paraplatin)
- Dacarbazine (DTIC)
- Ifosfamide (Ifex)
- Oxaliplatin (Eloxantin)
- Cisplatin and Thiotepa (Thioplex)

Nitrosurea
- Carmustine (BICNU)

Antitumor Antibiotic
- Daunorubicin citrate liposomal

Doxorubicin liposomal (Doxil)
Bleomycin (Blenoxane)

Epipodophyllotoxin
Etoposide (VP-16, Vespid)
Teniposide (VM-26, Vumon)

Biological Response Modifiers
Denileukin Difitox (Ontak)

Antibiotics
Oxacillin [> 7 days central line preferred]
Penicillin [> 7 days central line preferred]
Sulfamethoxazole-Trimethoprim (Bactrim) [> 14 days central line preferred]
Vancomycin (Vancocin) [> 7 days central line preferred]
Moxifloxacin (Avolex)
Levofloxacin (Levaquin)
Ciprofloxacin (Cipro) [> 7 days central line preferred, otherwise midline ok]
Gentamicin
Erythromycin (E-mycin) [central line preferred, dilute to <5mg/mL for peripheral administration]
Caspofungin (Cancidas) [> 7 days central line preferred]
Ampicillin [>14 days central line preferred]
Ampicillin-Sulbactam [>14 days central line preferred]
Azithromycin
Amphotericin B (Fungizone) [central line preferred, dilute to 0.1 mg/mL or less for peripheral administration]
Amphotericin B Lipid Complex (Ablecet)
Amphotericin B Liposome (Ambisome)

Antivirals
Foscarnet (Foscavir) [dilute to no more than 12 mg/mL for peripheral administration]

Amiodarone (Cordarone) [central line preferred if therapy exceeds 5 days, </= 2 mg/mL for peripheral administration]